

## Amendments to the Claims

1. (currently amended) An optical transmission system for transmitting an optical signal with an OCDMA code defined by a chip rate, comprising:

(a) an optical transmitter including ~~an input for receiving an encoding signal and an~~ a drive-signal-based encoder arranged to encode an optical signal with an electrical encoding signal at the chip rate, wherein the encoder is reconfigurable to provide [any one of] a plurality of encoding signatures codes according to the encoding signal;

(b) a transmission link for conveying the encoded optical signal from the optical transmitter; and

Q1 (c) an optical receiver comprising a grating decoder connected to receive the encoded optical signal from the input and decode the encoded optical signal, the grating decoder incorporating a ~~decoding signature matched to one of the encoding signatures so as to decode the encoded optical signal when encoded with the matched one of the encoding signatures~~ superstructure fiber Bragg grating configured as a matched filter to recognise one of the codes.

2. (original) A system according to claim 1, wherein the transmitter includes a modulator having drive electrodes and the encoding signal is an electrical signal connected to the drive electrodes.

3. (original) A system according to claim 2, wherein the modulator is a phase modulator.

4. (original) A system according to claim 2, wherein the modulator is an amplitude modulator.

5. (original) A system according to claim 2, wherein the modulator is one of: an electro-acoustic modulator; and an electro-optic modulator.

6. (original) A system according to claim 1, wherein the transmitter includes an optical delay line encoder.

7. (original) A system according to claim 6, wherein the optical delay line encoder comprises one of: a fiber coupler, a fibre grating, a planar lightwave circuit (PLC) and an arrayed waveguide grating (AWG).

8. (original) A system according to claim 1, wherein the transmitter includes an electrically driven laser source and the encoding signal is an electrical signal connected as a drive current to bias the laser source.

9. (currently amended) A system according to claim 1, wherein the grating decoder additionally incorporates a filtering function to compensate for signal distortions that result from the application of the encoding signal to the optical signal induced by the encoder.

10-12. Canceled

13. (original) A system according to claim 1, wherein the grating decoder is configured to decode a spread-spectrum encoded optical signal.

14. (currently amended) A receiver system according to claim 1, wherein the grating decoder is configured to decode an OCDMA-encoded optical signal a header in a packet-switched system.

15. (currently amended) ~~An optical transmission~~ A method for transmitting an optical signal with an OCDMA code defined by a chip rate, the method comprising:

- (a) encoding an optical signal with an electrical encoding signal at the chip rate using a drive-signal-based encoder configurable to provide a plurality of codes any one of a plurality of encoding signatures according to ~~an~~ the encoding signal;
- (b) transmitting the encoded optical signal over a transmission link; and
- (c) decoding the encoded optical signal using a grating decoder incorporating

a superstructure fibre Bragg grating configured as a matched filter to recognise one of the codes ~~decoding signature complementary to a matched one of the encoding signatures.~~

16. (currently amended) An optical transmitter comprising:

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an optical source for generating an optical signal modulated with a content-bearing signal and having a predictable distortion characteristic induced during modulation of the optical signal, wherein the optical signal is modulated by encoding with an electrical encoding signal; and

a superstructure fibre Bragg grating decoder incorporating a filtering function configured to compensate for the distortion characteristic and arranged to process the optical signal to compensate for the distortion characteristic.

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